No. 670,090. Patented Mar. 19, 1901.

J. TAYLOR & D. H. EVANS.

ENGINE STOP MECHANISM.

(Application filed Sept. 11, 1900.)

(No Model.) 3 Sheets—Sheet 1.

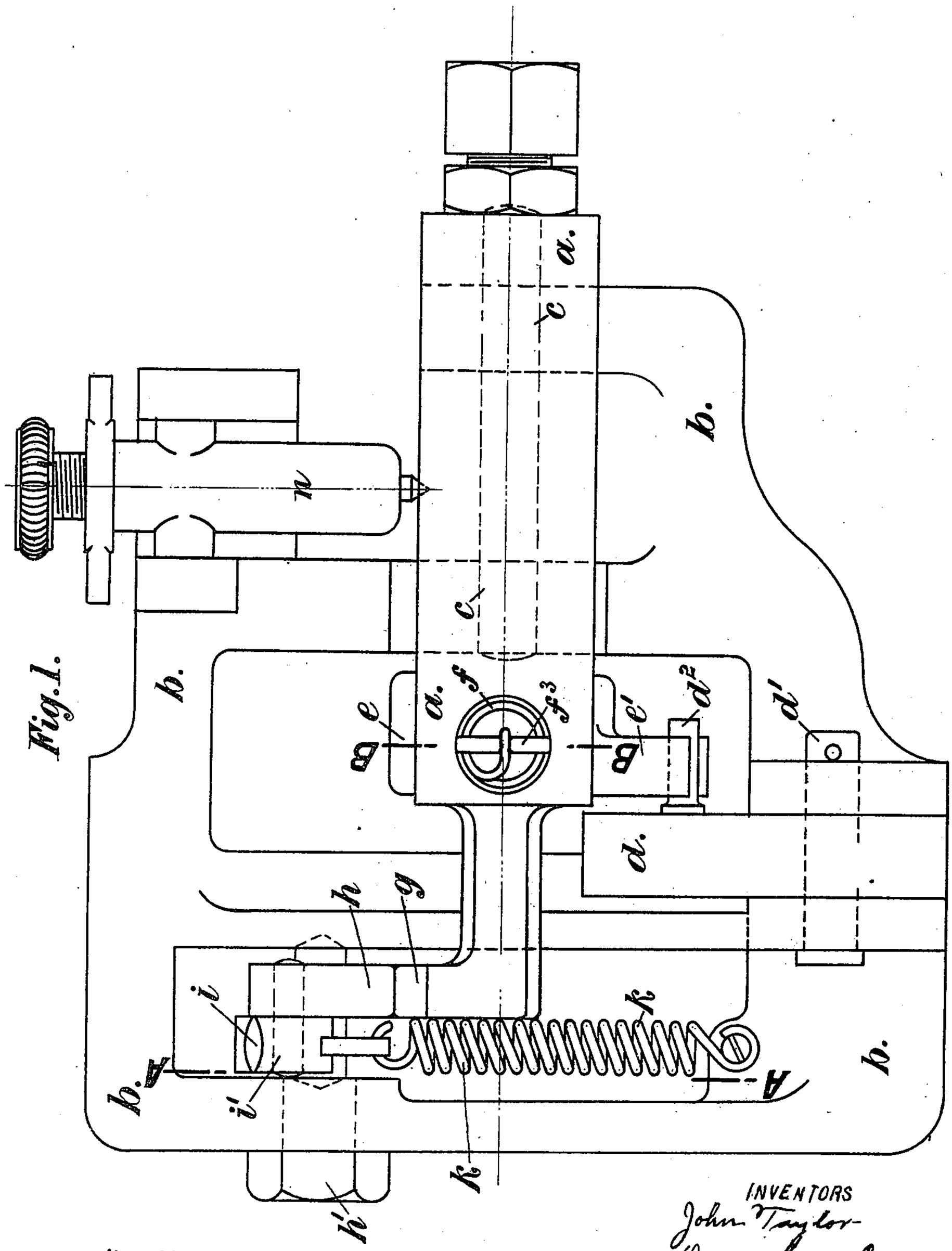

Fig. 1.

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Fig. 4.

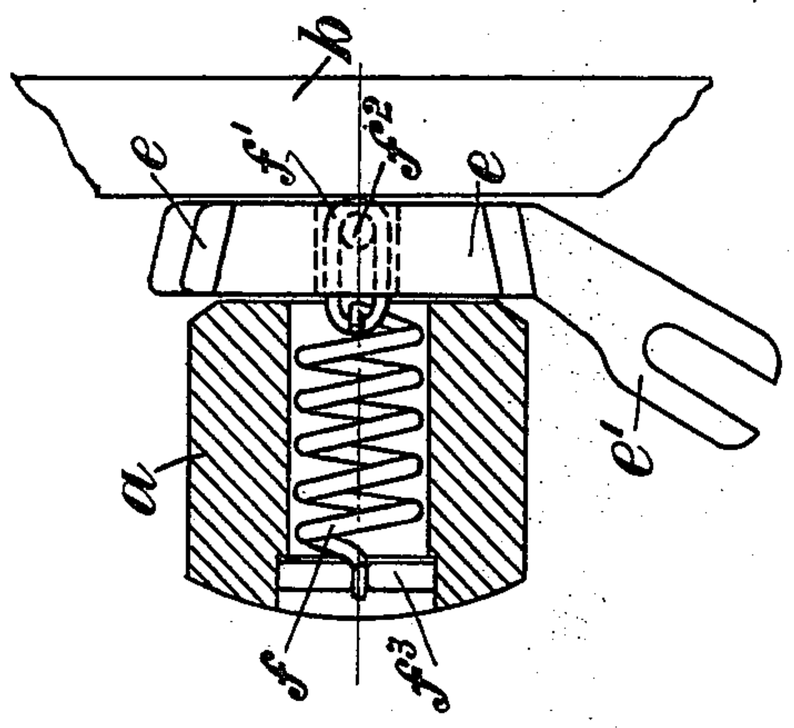

Fig. 2.

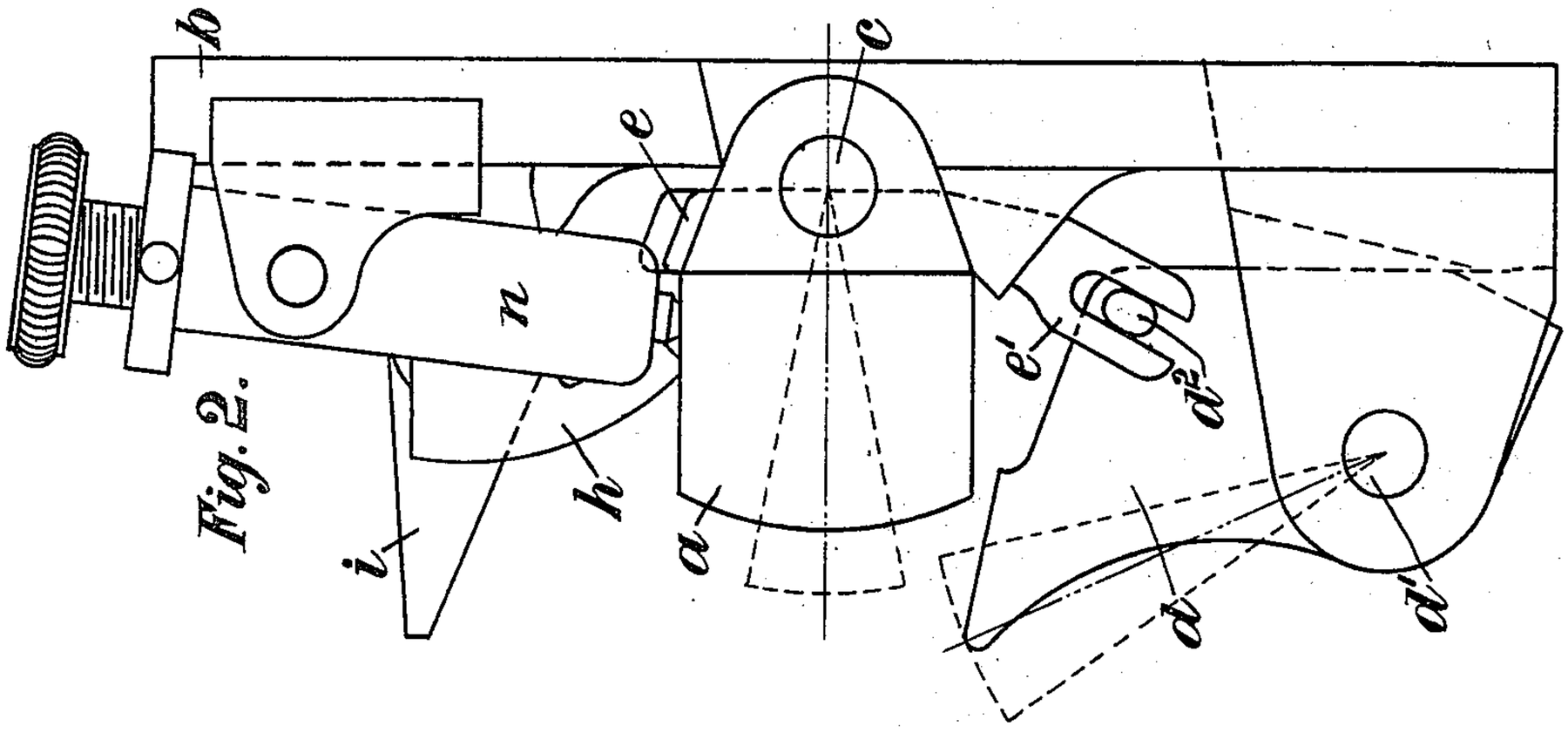

Fig. 3.

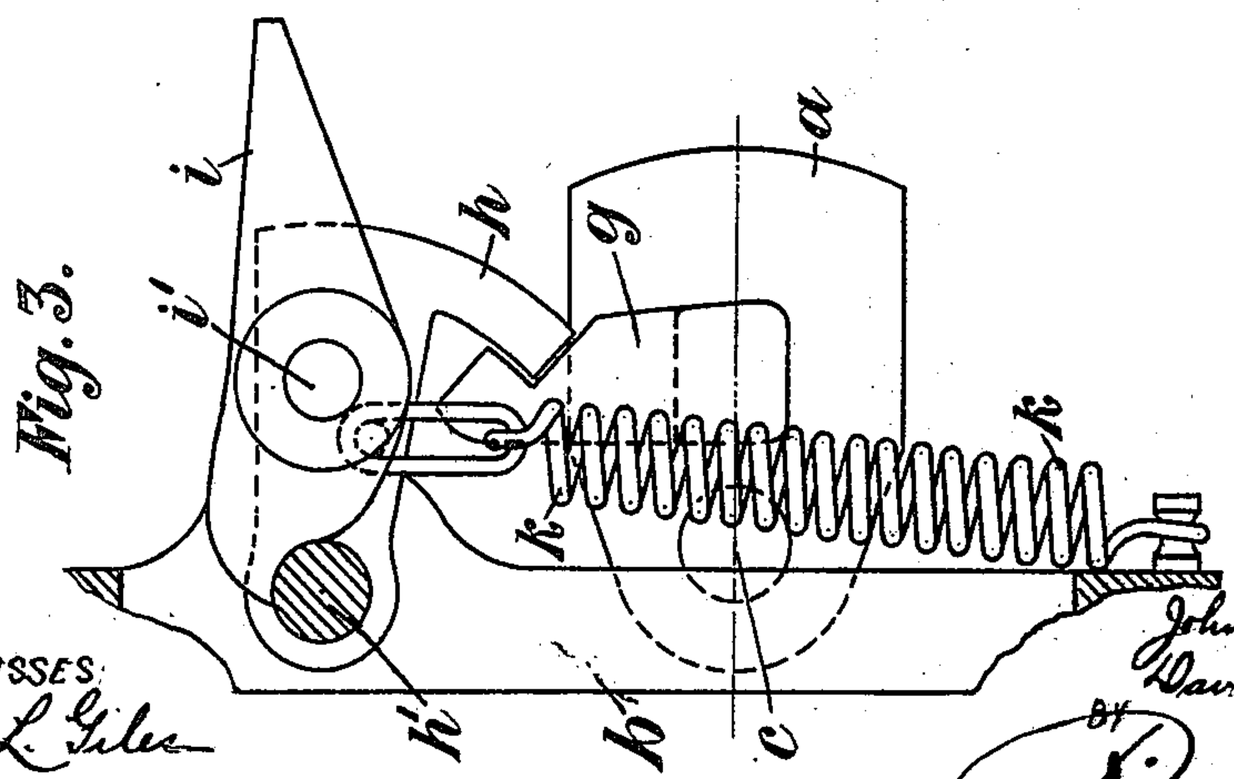

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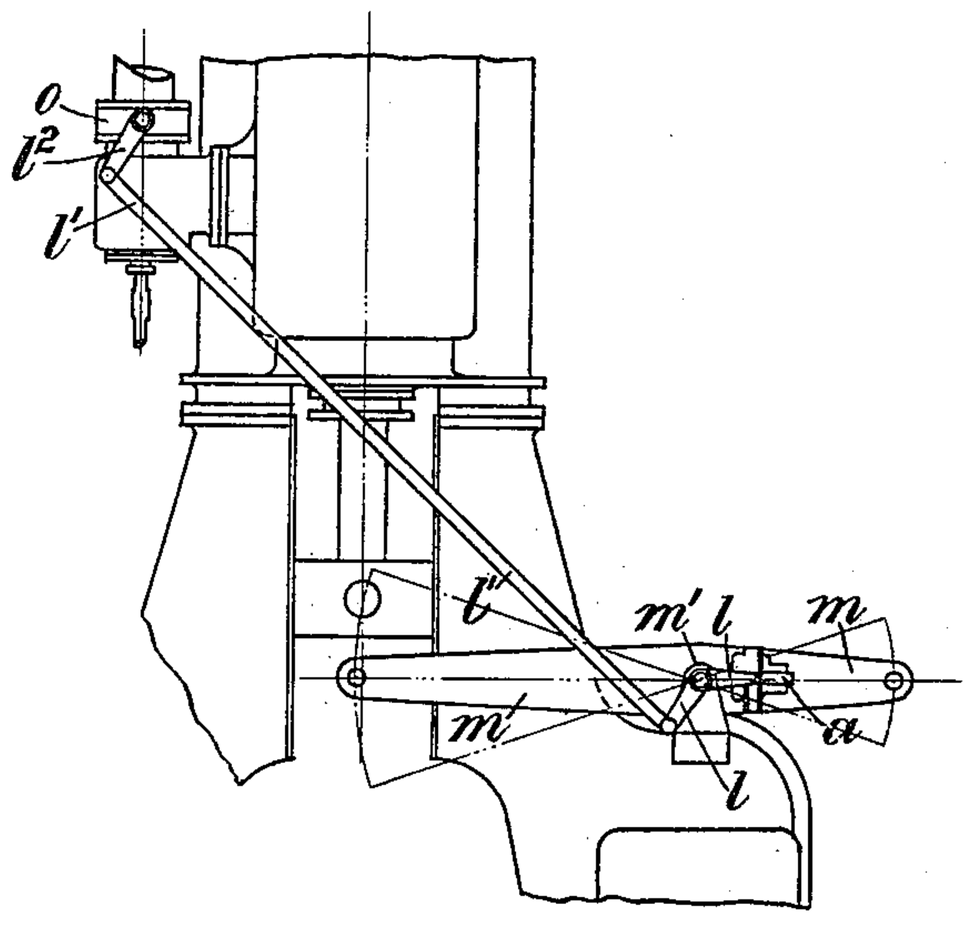
Fig. 5.



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JOHN TAYLOR AND DAVID HENRY EVANS, OF LIVERPOOL, ENGLAND.

ENGINE STOP MECHANISM.

SPECIFICATION forming part of Letters Patent No. 670,090, dated March 19, 1901.

Application filed September 11, 1900. Serial No. 29,689. (No model.)

To all whom it may concern:

Be it known that we, JOHN TAYLOR and DAVID HENRY EVANS, subjects of the Queen of England, and residents of Liverpool, in the county of Lancaster, England, have invented certain new and useful Improvements in Fluid-Pressure-Engine Stop Mechanism, of which the following is a specification.

This invention has for its object to provide a simple and convenient stop mechanism for automatically stopping steam and other fluid-pressure engines, such as those employed for electrical generation and for similar or equivalent purposes, by which the motor or power fluid whereby they are actuated will be automatically cut off or controlled in the case of a breakdown in the machinery itself or when the load or a great portion of the load is suddenly taken off the engine, but which, on the other hand, will be wholly inactive or inoperative while the engine is running under normal conditions and up to or slightly above the required rate of speed.

According to this invention the stop mechanism is mounted on and moves with a reciprocating part of the engine or part reciprocated thereby, and it works in connection with a lever or the like connected to a throttle, stop, or equivalent valve adapted for the controlling of the supply of motor fluid to the engine or in the engine.

The invention is illustrated in the annexed drawings, in which—

Figure 1 is a front elevation showing the apparatus. Fig. 2 is a side elevation of same; and Figs. 3 and 4 are sections taken at the lines A A and B B, respectively, in Fig. 1. Fig. 5 is a general view showing the arrangement of stop mechanism with an engine.

In stop mechanism according to this invention there is a loosely-mounted weight *a*, supported from the base plate or frame *b* by a hinge-pin *c*, passing through the back of the weight *a* and through lugs projecting up from the frame *b*. The center of gravity of the weight *a* when in its central position, as shown, and the axis of its support are about in the same horizontal plane; but the vertical plane in which the former lies is some considerable distance from that of the axis *c*. In connection with this weight *a* and below it there is a pawl *d*, supported loosely upon a hinge-pin *d'* in the frame *d*. The connection between the weight *a* and the pawl *d* is by a piece *e*, fitted on the under side of *a* and held thereon by the spring *f* and a projecting pin d^2 on the side of the pawl *d*, with which the bifurcated end or jaws *e'* of the piece *e* engages. The connection of the spring *f* with the piece *e* is by a link *f'*, the lower end of the spring engaging with one end of it, while the other end is secured by a pin f^2, passing through the piece *e*. The spring *f* is disposed within a hole through the weight *a* and connected to it by a pin f^3.

One end of the weight *a* is provided with a projecting part *g*, lying in a vertical plane near that of the support *c*, and the outer end of the projection is notched, and in connection with this notch the detent *h*, hinged at *h'*, is provided. On the side of this detent *h* there are carried a pawl and lever *i*, hinged at *i'* to the detent. The outer end of this lever *i* projects out to about the same extent as the pawl *d*, and its inner end bears on the boss of its supporting pin or joint, while the spring *k* is connected to it between its supporting-pin *i'* and its inner end, and this spring being in tension pulls it, and with it the detent *h*, normally toward the nose of the engaging part *g* of the weight.

The mechanism thus far described is fixed by its base *b* to the lever *m*, (which in many cases may be the air-pump lever of the engine or other vibrating lever or support worked by the engine,) and the throttle or other motor-power-fluid-controlling valve *o* will be operated by the mechanism through levers *l l' l²*, which will be connected with the throttle or motor-fluid-controlling valve disposed and vibrated or worked about its fulcrum in the vertical plane, and that plane will be such that when the pawl *d* is moved outward by the weight *a* when the mechanism comes into action it (the pawl) will engage with the lever *l* and move it about its fulcrum in this vertical plane. The lever *m* also vibrates about its fulcrum *m'* in the vertical plane and parallel with the plane in which the lever *l* is disposed and works. The normal position of the lever *l* will be the lower position. Normally the center of the mass *a* is below the axis of the hinge *c*—that is, the weight *a* lies normally in its lower position and the pawl

d therefore lies in its inner position. The limits of movement both of the weight a and the tip of the pawl d are shown by the radial dotted line in the drawings. In this position the end of the projecting part g will be out of engagement with the detent h, and the tip of the pawl d will be out of the plane in which the lever l lies, and this lever will be in its lower position. In action, in the lowermost position of the stroke of the governor, the lever l will stand at a point between the lever i and the tip of b, and the lever l being out of the plane in which the pawl moves when held in it will not be touched by the pawl in its stroke upward, and therefore the whole mechanism, under normal conditions, will simply go up and down without any internal action at all of its parts or upon the lever. When, however, the machinery breaks down or a sudden removal of the load from the engine takes place and a rapid increase of the rate of movement of the engine and governor consequently happens, in the first downward stroke after the acceleration of speed, the weight a by its inertia and increased momentum will at the change or reversal of movement from the upward to the downward stroke change its position and stand above the axis of its hinge c and so will move through the connecting-piece e the pawl d from its inner to its outer position and will force the engaging end of the locking part g under the nose of the detent h, and this detent will hold the parts in this position during the next downward and upward strokes. In the downward stroke, at the latter part of same, the back of the pawl h will have come in contact with the lever l; but this contact merely presses the pawl inward about its hinge, and the movement is enabled to take place through the flexible connection of the connecting-piece e with the weight a—viz., the spring f. Then when the pawl h has moved below the lever l the spring f pulls back connecting-piece e and the pawl d remains in its outward position. In the next upstroke of the stop mechanism the upper face of the pawl d strikes the under side of the lever l and moves it up, and so shuts off the motor fluid, and the lever will remain in this position, and so the engine will be stopped. In the downstroke following the active stroke the lever i will strike the lever l and will be moved by it and will lift the detent h out of engagement with the weight-catch g and free the weight, so that it can fall into its normal position as the engine slows down after the motor fluid has been cut off, but it does not move the lever l. When the lever i has been pressed back in this action a certain distance, it will slip past it and then be pulled back to its normal position by the spring k, and in the upstroke when it strikes the under side of the lever l, as the mechanism nears the upper end of its stroke, the lever i is merely moved about its hinge i'' until it slips past the lever and assumes its normal position.

The weight a is normally pressed downward by a spring-pressed bolt n of any known suitable kind, the degree of pressure being varied as may be required.

What is claimed in respect of the herein-described invention is—

A stop mechanism for automatically stopping fluid-pressure engines or motors, when a sudden decrease of load takes place, consisting of the weight a supported by hinge c in the horizontal plane; the single-hinged pawl d below the weight; the connecting-piece e connecting a with the pawl d, and attached to a by a spring f; the projecting catch g on the inner end of the weight a; the detent h adapted to engage with the catch g, and normally pulled by said spring k toward said catch by the spring k; the carrier m worked and vibrated by the engine; the lever l fulcrumed in a plane parallel with that in which pawl d moves, and adapted to be acted upon by said pawl; and motor-fluid-controlling valve, o, connected with said lever, and adapted to be closed thereby when moved; substantially as set forth.

In witness whereof we have hereunto set our hands in presence of two witnesses.

JOHN TAYLOR.
DAVID HENRY EVANS.

Witnesses:
ERNEST P. ROYSTON,
S. H. DAKEHOFF.